

7. Engine Family Categorization

For the purpose of demonstrating emission compliance, EPA is requiring that manufacturers of small SI engines divide their product line into groups of engines, called engine families, which are composed of engines having identical physical characteristics and similar emission characteristics. Small SI engine families are determined by using the same criteria currently used to define on-highway motorcycle engine families.

To be placed in the same engine family, engines are required to be identical in all the following applicable respects:

- (1) Combustion cycle;
- (2) Cooling mechanism;
- (3) The cylinder configuration (inline, vee, opposed bore spacings, and so forth);
- (4) The number of cylinders;
- (5) The engine class;
- (6) The number of catalytic converters (location, volume, and composition), and
- (7) The thermal reactor characteristics.

At the manufacturer's option, engines identical in all the above respects could be further divided into different engine families if the Administrator determined that such engines were expected to have different emission characteristics. This determination would be based on a number of features, such as the intake and exhaust valve or port size, the fuel system, exhaust system, and method of air aspiration.

8. Certificate of Conformity, Requirements of Certification

Each manufacturer of a new nonroad small SI engine is responsible for obtaining from the Administrator a certificate of conformity covering any engine introduced into commerce in the United States, before such engine is sold, offered for sale, introduced or delivered for introduction into commerce, or imported into the United States.

Section 203 of the CAA does not prohibit the production of engines, vehicles, or equipment before a certificate of conformity is issued. An engine, a vehicle, or equipment may be covered by the certificate provided:

- The engine conformed in all material respects to the engine described in the application for the certificate of conformity, and
- The engine, vehicle, or equipment was not sold, offered for sale, introduced into commerce, or delivered for introduction into commerce prior to the effective date of the certificate of conformity.

The Agency has established a number of requirements that an engine manufacturer must satisfy prior to granting a certificate of conformity. Engines equipped with adjustable operating parameters must comply with all the applicable emission standards over the full range of operating parameters and adjustments. Use of any device on a nonroad engine which senses operation outside normal emission test conditions and reduces the ability of the emission control system to control the engine's emissions is a prohibited act that is subject to civil penalties.

Use of defeat devices is a prohibited act subject to civil penalties. The Agency reserves the right to require testing of a certification test engine over a modified test procedure if EPA suspects a defeat device is being used by an engine manufacturer on a particular engine.

Finally, EPA is requiring that all engine crankcases be closed to preclude the emissions that occur when a crankcase is vented to the atmosphere. Since most currently produced engines do have closed crankcases, EPA believes this requirement will impact relatively few manufacturers.

9. Certification Procedures—Application Process

Each engine manufacturer must submit an application to EPA requesting a certificate of conformity for each engine family for every model year. The Agency will issue certificates to cover production for a single model year. An application must be submitted every model year even when the engine family does not change from the previous certificate, although representative test data may be reused in the succeeding model year's application.

The test engine(s) representing an engine family must demonstrate that its emissions are less than or equal to each separate emission standard. If the emissions from the test engine are below the applicable standards and all other requirements of the regulation are met (including the information required in 40 CFR part 90), EPA will issue a certificate of conformity for that engine family.

The application must provide EPA with sufficient information to assess the appropriate test results and determine the physical and emission characteristics of the engine family, as well as compliance with the applicable emission standards. It is important that the engine manufacturer succinctly, fully, and accurately submit all pertinent information to EPA and maintain internal records which can be

easily accessed if such access is determined to be necessary by EPA.

If changes to an engine family configuration occur after the application is submitted which cause the changed version to be the engine family's worst case emitter, then emission testing of the changed version is required. Additionally, the Administrator may require a manufacturer to conduct testing of a changed version that is not a worst case emitter to demonstrate compliance.

10. Certification Procedures—Testing Overview and Preliminaries

The emission level used to certify an engine family must be equal to the highest emission test level reported for any engine configuration in that family. The engine manufacturer is responsible for selecting and testing one engine from each engine family which is most likely to be that engine family's worst case emitter. The Agency expects that the worst case engine would normally be that engine configuration which has the highest weighted brake-specific fuel consumption over the certification test cycle, but will allow the manufacturer to submit data from another engine if it can support its contention that the alternative engine represents the worst case emitter. The Agency may verify the test results by requiring Administrator testing of this engine, or it may opt to test any available test engine representing other configurations in the engine family if it believes the manufacturer did not make a good faith effort to select the worst case emitter.

Before the manufacturer carries out emission testing, it must perform a number of hours of service accumulation on each test engine over the dynamometer cycle of its choice, based on good engineering practices (for example, an operational cycle representative of typical "break-in" of a new production engine in actual use). For each engine family, the manufacturer must determine the number of hours required to stabilize the emissions of the test engine, but this stabilization period cannot exceed twelve hours. The manufacturer must maintain and provide in its application to the Administrator a record of the rationale used both in making the dynamometer cycle selection and in making the service accumulation hours determination.

The manufacturer must conduct emission tests of the selected engine(s) using the test procedure established in 40 CFR part 90. However, this rulemaking does provide for EPA review and approval of special test procedures if the small SI engine is not capable of